

**SUCCESSFUL REINTRODUCTION OF CAPTIVE CHITAL (*AXIS AXIS*) IN WILD
HABITAT**

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Abstract

Chital is medium sized deer and an important prey base for top carnivores. Present Study area includes Kota Zoo (Captivity) and Mukandra Hills Tiger Reserve (Wild habitat) which was notified as Tiger Reserve in 2013. Chital from captive areas including Kota Zoo were translocated to Mukandra before tiger reintroduction to increase prey base. In spite of significant difference in behaviour of captive and wild Chital, translocated animals were successfully reintroduced and able to survive in natural habitat in Mukandra. Chital was adapted very quickly to natural condition and even extreme conditions in wild. Vigilance behaviour which was rarely observed in captivity in absence of predators is of utmost importance for survival in wild from predation and as observed vigilance behaviour was increased surprisingly after reintroduction, indicated that vigilance is an inborn behaviour in Chital. Chital was also able to survive in reduced physical condition during pinch period in wild. Reintroduced Captive Chital population spent more time in feeding in wild as compared to already existed wild Chital population. This might be probably because of less adaption of tanslocated Chital population for feeding natural vegetation in wild habitat, specially feeding on fallen leaves during winter season so they spent more time in search of food. Hence captive Chital from various zoos and biological parks of India was successfully reintroduced in the new natural wild habitat of Mukandra.

Key words: Prey, Behaviour, Vigilance, Feeding

Introduction

India has been a biodiversity rich country. Biodiversity is crucial for balancing the ecosystem. Studies on predator's diet revealed Chital as most abundant key prey species for big cats and it constitutes a bulk of Tiger's diet (Johansingh, 1992; Khan, 1995; Wegge et. al., 2009; Khan et. al, 1996; Stoen and Wegge 1996; Bagchi, et. al., 2003; Biswas and Sankar, 2002). Thus, management and conservation of Chital is essential for survival of Tiger in Tiger reserves. Tiger Reserve and Zoos plays vital role for wild animal conservation and management. Zoo also plays significant role in conservation of wild species and now a day's Zoos are converted in to Biological Parks which ensures to provide natural environment to wild animals to maintain their wild behavior necessary to survive when reintroduced in wild. The systematic acquisition and disposal of Chital from Zoo play key role in their management and conservation. The disposal of surplus animals from captivity to wild is done to fulfill requirement of wild habitat. Chital in captivity also provides important gene pool for future perspectives. Zoo play a role for present and future scientific management. This is executed through captive breeding and rehabilitation in wild.

Chital is native of India, Bangladesh, Nepal and Sri Lanka and introduced in Australia and United States of America (Prater, 1934; Schaller, 1967). Chital prefer ecotone between grasslands and dense forest at lower elevation of dry and mixed deciduous forest (Moe and Wegge, 1997). Chital usually avoid the interior of the forest and aggregate along road side clear areas in woodland and grassland habitats (Noor et. al., 2013; Sharma and Sharma, 2014; Varman and Sukumar, 1995). Chital favours ecotone between the forest and the grassland, they do not like closed dense forest (Chandra, 2013). Chital remain associated with langur in wild (Newton, 1989). Chital (*Axis axis*) feeds on a number of plant species as food (Johansingh and Sankar, 1991) and grazing to browsing ratio changes in different season considerably which depends on the availability of food (Khan, 1994).

Study area includes wild habitat Mukandara Hills Tiger Reserve (MHTR) and captivity Kota Zoo (KZ). Mukandra hills Tiger Reserve was established as National Park in 2012 and as Tiger Reserve in 2013. It was a Tiger Reserve without tiger in 2013 and since then main focus was on

tiger reintroduction in MHTR. For tiger reintroduction prey base was an important issue. Chital was the most abundant ungulate prey species among all ungulate species in MHTR (Khan and Sultana, 2014).

Methodology

Observational Research Design was used in the present study conducted during 2017-18. Direct observation is the best method for behavioural study of animal in field. Behavioural observations was done by scan sampling techniques (Altmann, 1974). The preferred method for identification of animal in wild is to observe the animals with binoculars (Mathur, 2002). Data were collected mainly from primary sources and a little from secondary sources as well. The primary data were collected from direct observation of study animal. Secondary data were collected regarding Chital translocated in wild habitat MHTR from captivity from DCF office (wildlife), Kota and DCF office, MHTR to observe the reintroduced Chital population.

The Chital herds were continuously followed as long as possible on foot or on Motor-cycle from dawn to dusk in different time intervals. Observations were recorded at the adequate distance from the animals so as to avoid the influence of observer's presence on the natural activity of Chital herd. The field observations were carried out with the aid of binocular and Camera. The data were recorded on elaborate check sheets (Ethograms).

Results

The study was conducted in Kollipura and Borabas Range. Chital population was consistently increasing since the declaration of Mukandra National Park in 2012 and Mukandra Hills Tiger Reserve in 2013. Reintroduction of Chital during the study period in MHTR was done from captivity Kota Zoo and other Captive habitats such as Jaipur Zoo, Shahpura Sanjay Van, Ashok Vihar Deer Park. Similarly. Chital were also translocated from Jodhpur zoo and Rashtrapati Bhawan, New Delhi to MHTR and attached Bhainsrodgarh rehabilitation center. Translocated Chital preferred to live in the vicinity of road sides initially after translocation. Later they adapted quickly to wild habitat and exhibited the alert behaviour in increased frequency. It was seemed to be positive sign for translocated Chital population to survive from predators and any

other danger in wild. Health condition was better in wild (MHTR) as compared to captive habitat (KZ) might be due to availability of different type of food plants, browse, fallen leaves and fruits rich in nutrients in different season. Chital population was seen to increase rapidly in new introduced habitat.

Discussion

Prey population decides the predator population hence conservation and reintroduction planning for top predators like tiger, lion and leopard in human dominated fragmented area (shared with livestock) requires information on ecology and ethology of prey population (Bagchi et. al., 2004; Nama et. al., 2013). Chital was the most abundant ungulate key prey species in present study as was discussed in earlier studies (Schaller, 1967; Eisenberg and Lockhart, 1972; Johansingh, 1983; Dinerstein, 1980). The larger groups were composed of many basic family units, which usually observed united together temporarily during feeding, travelling and resting (Graf and Nicholas, 1966).

Group size and Social organization of group played an important role in behavioural patterns displayed by animal. Chital was observed to live in small to medium sized herds same as earlier studies (Prater, 1971; Nikica, et. al, 2008). Among all wild ungulates, Chital showed highest mean and typical group size (Bagchi et. al., 2008; Dave, 2008). They were used to aggregate from evening onwards as the scattered deer herds for grazing move towards their night resting places in open grassy area similar to previous studies (Sharatchandra and Gadgil, 1975).

Chital group members were not associated with each other by social bonds and frequently leave or join a group indicated fluid nature of their herd. Group size was determined by availability of food, habitat structure, predation pressure and group composition ((Barrette, 1991; Khan and Vohra, 1992). Mean group size changed considerably between seasons depending on the availability of food. The herd size was observed maximum during wet season due to increased availability of forage in monsoon as in previous studies (Ramesh et. al., 2012). The fission fusion pattern of grouping in Chital is thus affected by many factors and social behaviour was also involved to explain the changes in group size (Raman, 1997).

Mixed herd was the basic unit of the social organization in Chital whereas female-young and all male associations were temporary associations (Tak and Lamba, 1984). Fawn sex ratio represented an equal sex ratio at birth and an approximate equal sex ratio is to be expected in an area which is devoid of selective predation (De and Spillet, 1966). Chital Adult sex ratio and population structure was biased towards female (De Silva and De Silva, 2001; Karanth and Sunquist, 1992; Majumder, et. at., 2013). Chital Adult sex ratio was changed seasonally because more stags joined the groups during breeding season (Srinivasulu, 2001).

In Chital, males with all type of antlered condition were present which indicated the fact that breeding occurs throughout the year. This fact was further proved by the occurrence of fawning throughout the year. Almost all fertile females conceived and give birth to young. The ability to exist in a reduced physical condition, that Chital has shown was of obvious survival value to any animal facing too much kind of adverse (Krishnan, 1972). Fawning was also associated with velvet antlered condition (Mishra, 1982). Thus, almost all females of Chital were successful in reproduction while only few dominant males were involved in breeding activities (Sharatchandra and Gadgil, 1980). Chital was a timid and social animal. It's antipredatory behavior contributed a lot to its social behavior (English, 1992).

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